



University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

Office of the Director

RL:0282

SR 37
REQUESTING EXAMINATION OF PROPOSED
BARBER'S POINT HARBOR

Statement for
Senate committee on Transportation
Public Hearing 9 March 1978

By
Doak C. Cox, Environmental Center
Frans Gerritsen, Ocean Engineering
William J. Kimmerer, Oceanography
Jacquelin N. Miller, Environmental Center
Janie Patch, Pacific Urban Studies and Planning Program

SR 37 calls upon the Senate Committee on Transportation to examine the proposal to construct a deep-draft harbor at Barber's Point in connection with plans for Honolulu Harbor. This statement reflects long-held concerns of the Environmental Center with the Barber's Point Harbor proposal, but does not reflect an institutional position of the University.

Attached to this statement are: 1) a Center review of the State EIS on the Barber's Point Harbor (RE:0232); and 2) a November 1977 statement concerning the Barber's Point Harbor addressed by the Center to the House Interim Subcommittee on the Honolulu Harbor Master Plan (RG:0036).

In the latter, the Center questioned the justification for the proposed Barber's Point Harbor on these grounds:

1. The actual severity of certain potentially very severe natural hazards to the Harbor has not been determined.
2. The actual severity of certain potentially very serious environmental detriments of the construction and use of the harbor has not been evaluated.
3. Certain benefits that the harbor will provide seem exaggerated.

These grounds are expanded in the earlier statement, and still further in the 1977 Center review of the EIS in the harbor (RE:0232).

Not all of the authors of these earlier statements have been available to review SR 37, but we have no reason to suppose that any of them have altered these opinions or would disagree with the opinions expressed in this statement. The additional authors of this statement have indicated similar opinions and expanded on them.

With request to the natural hazards, we see no reason to expand upon our earlier statements.

With respect to the environmental effects of the construction and use of the proposed harbor, we call attention to the importance of regarding the harbor, not just as a transportation system element but as a major element in development. In some ways it is consistent with more general transportation planning of the city-county and the state, in other ways it is inconsistent. For example, mass-transit planning for Oahu focusses on transportation needs for the eastern part of the island, whereas the Barber's Point Harbor and the development it would stimulate would increase mass-transit needs in the western part of the island. In some ways the proposal is consistent with more comprehensive plans and policies of the city-county and the state, and in other ways inconsistent. It is inconsistent with the policy of controlled growth, for example, and it is likely to be inconsistent with the policy of maintaining agricultural productivity.

Two of the premises expressed SR 37 related to the question of the benefits that the harbor would produce and the balance of benefits and cost. As indicated in our earlier statements, there is serious reason to question the economic benefit estimates that are cited in the resolution, and hence the benefit/cost ratio cited (even if the natural hazard effects and the non-construction costs are overlooked). We earlier called attention to the fact that shippers will prefer not to use the proposed harbor, also indicated that the present plans for expansion of facilities at Honolulu Harbor do not represent the limit of feasible expansion. One of us has recently confirmed that Matson Navigation, the company providing the major shipping services to the State considers that, with certain expansions of facilities, Honolulu Harbor will be capable of meeting needs for 30 to 40 years.

It is true, as SR 37 indicates, that "construction of a second major commercial port has been proposed since statehood, with Oahu's leeward coast as the prime candidate for such a facility." However, we consider that the justification so far presented for the proposed Barber's Point Harbor is inadequate, and in some respects misleading and even invalid. We believe that thorough reconsideration by the Senate Committee on Transportation is appropriate. We do not believe that reconsideration during the present revision of the Legislature is likely to indicate that the establishment of the Harbor is appropriate, because so many important questions remain unanswered or inadequately answered. Such reconsideration might indicate that establishment of the Harbor in the near future is not warranted.



University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

Office of the Director

November 22, 1977

RE: 0232

MEMORANDUM

TO: Chairman
Environmental Quality Commission

FROM: Doak C. Cox, Director *Doak C. Cox*

SUBJECT: Review of Barbers Point Deep-Draft Harbor
State Environmental Impact Statement

The following members of the University community have contributed to the preparation of this review: John T. O'Brien, Frans Gerritsen, and Charles Bretschneider, Ocean Engineering; Martin Vitousek, Geophysics; William J. Kimmerer, Oceanography; Harold Loomis, Joint Tsunami Research Effort (NOAA); Hiroshi Yamauchi, Agricultural and Resource Economics; and Jacquelin N. Miller and Doak C. Cox, Environmental Center.

The Federal EIS for the Barbers Point Harbor dealt primarily with the environmental impacts associated with the harbor construction per se and specifically deferred to the State EIS the evaluation of the environmental impacts associated with the land based operations and required shoreside facilities and utilities. The Center's reviewers have expressed serious concern at this policy of two separate and essentially non-coordinated EIS documents for a single project. The resulting two documents suffer from redundancy and thus extra cost in some sections and serious omissions in others. The following comments are offering for your consideration:

Page 1-3. The Statement of Objectives contains erroneous and misleading statements. Item 1, for example, states that depths in Honolulu Harbor are inadequate to handle ships presently using the area, particularly petroleum carrying vessels. However, Honolulu Harbor is currently planned for dredging (40 to 45 feet) (Federal EIS, 17 January 1977) to eliminate the depth limitations and in fact will be deeper than the 38 feet Barbers Point Harbor. Item 2 sites steorage difficulties in Kapalama Channel. This too is addressed and will be eliminated with the planned dredging. Item 3, the adequacy of Honolulu Harbor's existing shoreside facilities beyond the year 1980 is questioned yet in the next sentence this 1980 figure is modified to 1990-95 assuming the States planned shoreside improvements. The Federal EIS on Honolulu Harbor (January 17, 1977) states specifically that Honolulu Harbor will "physically accommodate all Oahu waterborne commerce needs through the 1990-1995 period.

Item 3 states that there is a lack of available industrially-zoned warehousing space in the Honolulu Harbor area and that existing warehousing space is gradually eroding and being redeveloped to non-industrial uses. If this is the case, one must ask why such non-industrial uses are being pursued or allowed in an industrially zoned area?

Page I-14. We seriously question the rationale for exclusion of the sewage treatment and disposal facilities and other off site utilities from the construction costs used in deriving the cost-benefit ratios.

Page I-14, II-52, III-22. According to the EIS (pages II-52 and III-22), no specific plans have been made to include wastewater flows from Campbell Industrial Park in the Honouliuli sewage treatment plant and disposal facility and an additional treatment plant and disposal facility will be needed. To the extent that the new plant and facility will be made necessary by the proposed port development, their cost should be added to the other costs of the port development. If an additional ocean outfall will be required, the additional cost will be substantial. In the case of injection wells for wastewater disposal, the impacts of high levels of nutrients on the coastal waters from the livestock shipments must be considered.

Page I-16. We also question the derivation of the Equivalent Annual Operation and Maintenance cost for, "maintenance dredging wave absorber, and aids to navigation" of \$34,000. This number seems unreasonably low.

Page II-49. Table II-7 reflects some 75 industries with a water transportation orientation deemed suitable for the park. There appears to be considerable overlap of potential industrial operations. What was the basis used in selecting these particular industries?

Pages II-52 and III-22. The Board of Water Supply has stated that the fresh water resources are inadequate to satisfy present demand. The costs and sources of fresh water supply should be included in the EIS.

Page II-53. What are the noise levels and frequency of exposure that will be experienced at Barbers Point Harbor area due to naval air stations operations?

Page III-4. There is no mention in the text of the need expressed by Hawaiian Independent Refinery, Inc. to assure continued use of the barge harbor during construction so as to accommodate neighbor island propane transport.

Impacts on coral reefs

Page III-6. It seems implied in the EIS that the coral reef in the vicinity of the present barge harbor and proposed deepwater harbor is not well developed. This is true in the immediate vicinity, but a few hundred yards to the north, coral heads up to 30 feet in diameter and height are common. It

November 22, 1977

seems implied that deleterious effects of the harbor construction on the coral will end after the construction is complete. It is difficult to believe that the operation of the harbor will not have significant effects, and the potential for such effects should be examined.

Tsunamis

Page III-13. The discussion of the effects of tsunamis on the harbor is quite inadequate. On page III-13, the behavior of "a single 15-foot wave" is described. Since the height of a tsunami is depth dependent, it is meaningless to describe a tsunami wave in the ocean by a single height without indicating at what depth this height pertains. It appears that what is meant is a 15-foot wave at the 42-foot depth of the outer channel. It is indicated that the wave height will increase to 17 feet in the inner channel (38 feet deep) and that it will result in large resonant oscillations in the barge harbor, but that the wave height will drop to 4 feet in the channel inland of the barge harbor, and presumably still more by diffraction in the main basin. This discussion is meaningless, because the effects of resonance in the barge harbor will depend upon wave period.

The effects of resonance are considered on page III-14 where it is recognized that the main basin will have a resonant peak centered at a period of about 13 minutes, close to the period of the 1946 Aleutian tsunami. The Waterways Experiment Station study which brought this resonance period to light suggested a very large associated amplification factor, 8.5. As pointed out in the EIS, this study did not take into account the dissipative effects, such as those associated with land flooding. It also did not take into account the fact that the initial apparent period of a tsunami persists for only a few waves. It should be recognized, however, that if the 8.5 amplification factor actually applied to a 4-foot wave entering the harbor, the resulting 34-foot oscillation would be catastrophic.

The EIS indicates the need for further studies to evaluate the tsunami effects, but does not indicate definitely that such a study will be made. Considering the very great importance of the effects that might occur, so far as present information indicates, it must be judged that the address to the tsunami problem in the present EIS is quite unsatisfactory. Certainly no harbor in Hawaii should be constructed on the basis of such inadequate information as to the tsunami hazard.

Surges

Page III-14. The problem with surges is dismissed with the statement on page III-14 that "As part of the tsunami evaluation study, the potential for surge problems in the proposed harbor should be addressed." The same Waterways Experiment Station study that brought to light the 8.5 amplification factor for 13 minute waves called attention to much larger amplification factors associated with periods within the range of long swells and seiches generated by such swells.

November 22, 1977

In harbors protected permeable or perforated breakwaters, the surge problem may be slight, but in a land-enclosed harbor with relatively simple geometry such as is proposed at Barbers Point, the seiche problem may be a very severe one. It should be recognized that the recurrence frequency of significant long-period swells is much higher than that of significant tsunamis, and that a recurrent surge problem may seriously reduce the utility of a harbor. The horizontal water motions can be quite strong and can result in breaking mooring lines and damage to ships, fender supports, or both.

The Look Laboratory has performed model tests on the proposed harbor, but these were intended to indicate means to reduce ordinary wave effects within the proposed harbor and did not address surges. The EIS on the harbor cannot be considered adequate until it reflects the results of studies of the potential surge problem.

Page III. Storm effects. The effects of storms on the proposed harbor are not addressed except with respect to wind effects on water transport (currents) within the harbor. The potential exposure of the harbor to hurricanes and storms of near-hurricane strength should be discussed.

III-5. What percent of the coral stockpiled will be required by the Department of Agriculture for Oahu crop production needs for Calcium?

III-7. Why is the harbor being dredged only to a depth of 38 feet? If Honolulu Harbor requires deepening to 40-45 feet, why won't Barbers Point Harbor require a similar depth?

Page III-40. Much of the rationale for immediate construction of the Barbers Point Harbor seems to rest on the present cost of land transportation of freight between Honolulu and Leeward Oahu. However, the extent to which the construction of this new harbor would result in decreased costs must depend critically on the extent to which the cargo of certain ships may be intended exclusively for delivery to Leeward Oahu. The cost per unit distance of water transport of freight is low, but the costs of partial unloading of freight from a ship at each of two ports may well exceed the cost of a single unloading and land transport. The increase in cost for the shipping firms unloading a ship at both ports probably accounts for the statements by shipping firms that they do not intend to use the proposed Barbers Point Harbor.

Page III-41. Many of the projections on which the proposal for the Barbers Point Harbor is based are questionable. In particular, it is questionable that shipments of petroleum to Oahu will increase five times in the next 50 years. In the light of the world petroleum supply situation, the availability of a supply to sustain this increase is doubtful; the increased cost per unit volume will undoubtedly curb per capita demand; and the State policy of controlled growth will also control future petroleum demands. Elimination of a need for a \$9 million investment in offshore moorings for tankers is indicated as a rationale for the Barbers Point Harbor, but it is not clear whether this is a future investment need or an investment in present facilities.

Effects on agriculture

Page III-41. The EIS recognizes that 8½ acres of land will be removed from sugar cultivation by the harbor construction but that Oahu Sugar Company officials indicate that this land is of marginal economic value because of terrain and distance. The EIS also recognizes that the Campbell Estate master plan calls for conversion of 7,200 acres of land from agricultural use to urban use, 36 percent of the Oahu Sugar Company cane acreage (page II-46). The EIS claims that the establishment of a deepwater port at Barbers Point will add very little to the increase in the population of the Ewa district beyond what is anticipated without the port. An important question not addressed is whether the increment of increased urbanization in the Ewa District attributable to the deepwater port might result in the decrease of total acreage available for sugar cultivation below the economic minimum, and hence be responsible for bringing an end to the operation of Oahu Sugar Company.

Impact on construction industry

Page III-42. Much of the rationale for the construction of the proposed Barbers Point Harbor appears to rest on an offset to the decrease in the construction industry of Hawaii in the recent years. The facts of the decrease and of related unemployment are unquestionable. However, continued maintenance of a high volume of construction is neither expectable nor desirable. A continuing high volume of construction would require the maintenance of a rapid growth in the State's economy. Economic indicators suggest, however, that continuance of rapid growth in the future is not expectable; and the social and physical environmental detriments of the rapid growth of the past have led the State to adopt a controlled growth policy. With controlled growth, so large a construction industry will not be needed in the future. A stimulated construction industry is a stimulus to growth and hence represents an undermining of the policy of control of growth.

Page IV-1. The no-construction alternative has not been discussed. What are the options in terms of rezoning and upgrading the facilities at Honolulu Harbor to accommodate post 1995 needs? The State of Hawaii Growth Policies Plan 1974-1984 has recommended slowed growth, non-sprawl into prime agricultural lands, and emphasizes neighbor island development. Is the proposed Barbers Point Harbor consistent with these recommendations?

Since the Honolulu Harbor facility will be adequate until approximately 1995 and the need for two deep draft harbors within 16 miles of each other to serve such a modest population and area appears to be subject to some question, the alternatives of a total long-term shift of commercial harbor facilities from Honolulu to Barbers Point might be appropriate.

The chapter of the EIS on alternatives (Chapter VI) assumes that there must be a second deep draft commercial port on Oahu on the basis of an authorization in the Rivers and Harbors Act of 1965 and on inadequacies of Honolulu Harbor. A recent EIS on Honolulu Harbor deals with planned improvements with Honolulu Harbor that will make it adequate until 1990 or 1995. There is

November 22, 1977

no proof in either that EIS or this one that the possible improvements at Honolulu are limited to those planned and no discussion to indicate that further improvements of Honolulu Harbor would be less desirable than the establishment of a new deep-draft port.

Alternatives: Partly offshore harbor

The alternative of a partly offshore harbor (figure IV-1C) is examined but discarded on the grounds that the entering wave energy to the harbor would be too great. Reorientation of the entrance jetties could easily eliminate the problem, however, without additional cost.

Offshore harbor

In the discussion of alternatives there is only a minimal discussion of the alternative of an offshore harbor. Earlier correspondence with the Corps of Engineers indicate that this alternative has not been studied because: "While innovative offshore berthing structures may be feasible in other countries, any offshore structure at the proposed harbor site would probably require protective structures. Construction of breakwaters or other offshore structures would destroy or damage considerably more reef area than the proposed inland harbor."

There is no indication why innovative offshore berthing facilities are not feasible in the United States, and specifically in Hawaii; and it is not clear that the construction of protective structures for an offshore harbor at Barbers Point would destroy or damage more reef area than the construction of the proposed harbor.

Deferred construction

The EIS claims that Honolulu Harbor, even with planned improvements, will be inadequate to meet commercial needs beyond the period 1990-1995 (page I-3). It projects a five-year construction period for the proposed Barbers Point Harbor. Thus the proposed harbor will be provided 7 to 12 years before it is needed.

Even it is assumed that the harbor is economically justified, there is no showing that the economic justification for initiating construction of the harbor in the immediate future will be greater than or even as great as the economic justification for initiating its construction 7 to 12 years from now, and no discussion of the opportunity costs of construction now. It is doubtful that construction in the immediate future can be justified, particularly in the light of the statements by major shipping firms that the use of the Barbers Point Harbor will not be advantageous to them.

cc: Contributors
OEQC
Department of Transportation
Darro Thuet



University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

Office of the Director

PROPOSED BARBERS POINT HARBOR

Statement for the House Interim Subcommittee on the
1995 Honolulu Harbor Master Plan
Public Hearing 25 November 1977

by Doak C. Cox
Director, Environmental Center

Representative Takamura and Members of the Committee. My name is Doak C. Cox. I am Director of the Environmental Center of the University of Hawaii. The functions of the Center include the coordination of environmental services of the University community. Among such services is the review of Environmental Impact Statements such as that which has been produced as required by State law for the proposed Barbers Point Harbor. We have submitted copies of our review of this Environmental Impact Statement, RE:0232 for your use. Since it is lengthy, I will not read the review but merely summarize a few salient points. Before I do so, I should call to your attention the facts: 1) that neither the review nor my remarks reflect an institutional position of the University, and 2) that the Environmental Center does not take sides in questions involving subjective value judgements but attempts to contribute to the objective information on which such judgements should be based. In our reviews of Environmental Impact Statements, we are particularly concerned that all pertinent and available or reasonably producible objective information be provided.

Our review of the Environmental Impact Statement on the proposed Barbers Point Harbor has led us to question whether, on the basis of information presented, the construction of the Barbers Point Harbor can be considered justified and if so whether the initiation of construction in the immediate future, as planned, can be justified.

Our reasons for questioning the justification for the harbor are of three kinds. First, the actual severity of certain potentially very serious natural hazards has not been determined. Second, the actual severity of certain potentially very serious environmental detriments of the construction and use of the harbor has not been evaluated. Third, certain benefits that the harbor will provide seem exaggerated.

The two potentially most serious hazards are those of tsunamis and surges. The Waterways Experiment Station of the Corps of Engineers has pointed out that the proposed harbor will amplify tsunami waves by resonance. The theoretical amplification factor which they have provided would lead to catastrophic wave

heights in the harbor. The theoretical factor is undoubtedly too high, but studies to estimate more realistic factors have not been performed. Significant tsunamis are rare events, but long-period swells capable of generating harbor surges are common. The Waterways Experiment Station has also called attention to the presence of several surge amplification peaks. Through model study, the Look Laboratory of the University has investigated the direct effects of waves in the harbor; and means for the reduction of these direct effects have been incorporated in the harbor design. The model study did not, however, examine the potential surge problem. Surges in the harbor might be so severe and so common as to interfere seriously with its use.

I will mention only two inadequacies in the analysis of environmental detriments. Both relate to secondary environmental effects.

It is recognized that construction of the harbor will itself entail the loss of a little sugarcane land. The construction of the harbor will also stimulate industrial development in the area, which in turn will stimulate the development of additional housing areas. The EIS claims that the additional housing actually attributable to the harbor will be very small compared with the additional amount that will be provided in the area anyway, and that official plans for the area call for extensive urbanization. There is, however, a limit to which urban development in the vicinity can proceed before the amount of land in sugarcane cultivation decreases below the economic minimum necessary for the continuance of the plantation in the area. The question whether the increment of urbanization in the vicinity attributable to the proposed harbor might cause the collapse of the plantation is not addressed in the EIS.

As the EIS recognizes, unemployment will be reduced with construction of the harbor, and the construction is validly recognized as a stimulus to the construction industry in particular. (No special stress need to be laid on the fact that the federal contribution to the stimulus will be great. It is always politically appealing to spend funds derived from national taxes, even though we help pay those taxes.) The question that is not addressed in the EIS, but should be, is the extent of stimulus to the construction industry that is justified. A stimulated construction industry is a stimulus to growth, and an over-stimulus would undercut the policy of controlled growth that has been adopted in this state.

I will mention only one exaggerated benefit--that is the benefit associated with the more efficient means the harbor would provide for unloading petroleum products. It is based on the assumption that petroleum imports will increase five times in the next 50 years, an assumption that seems highly questionable in the light of the world petroleum resource situation, and the certainly escalating price of petroleum, even if projected increases in the population of Oahu and of the State are valid.

Even if further analysis on these and other questions confirmed the future justification for the construction of the harbor, there remains the question why it is proposed for construction now.

The EIS discusses present inadequacies in Honolulu Harbor, and also plans that have been made to remedy these inadequacies to the extent that Honolulu Harbor will be adequate to meet needs until sometime in the early 1990's. (Incidentally, there is no adequate discussion of the relative costs of further

improvements at Honolulu that would make Honolulu adequate for a longer term vs. the costs of construction of a wholly new port to supplement Honolulu. The construction of the new port, it is estimated, will take five years. It will, therefore, be ready for use 7 to 12 years before it is needed. Statements by shipping concerns quoted in the press indicate they will not split operations between Honolulu and Barbers Point. It appears then, that the new harbor will be unused or at least underutilized for a considerable period. In the meantime, competitive needs for the funds that have been invested in its construction will not have been met.

It appears clear that the final decision to proceed with the construction of the Barbers Point Harbor should not be made until questions such as those to which we have called attention have been answered, unless the community and its official representatives consider the questions unimportant.